



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PUBLICATIONS  
OF THE  
Astronomical Society of the Pacific.

Vol. XXXII.

San Francisco, California, February, 1920

No. 185

LIST OF MEMBERS  
OF THE  
ASTRONOMICAL SOCIETY OF THE PACIFIC  
FEBRUARY 1, 1920.

OFFICERS OF THE SOCIETY

J. H. MOORE.....	<i>President</i>
BERNARD BENFIELD.....	<i>First Vice-President</i>
J. COSTA.....	<i>Second Vice-President</i>
A. L. BLACK.....	<i>Third Vice-President</i>
D. S. RICHARDSON.....	<i>Secretary and Treasurer</i>
<i>Board of Directors</i> —WM. H. CROCKER, C. S. CUSHING, D. S. RICHARDSON, J. COSTA, R. G. AITKEN, GEO. E. HALE, B. BENFIELD, W. W. CAMPBELL, A. L. BLACK, J. H. MOORE, STURLA EINARSSON.	
<i>Publication Committee</i> —R. G. AITKEN, H. SHAPLEY, J. H. MOORE.	
<i>Finance Committee</i> —C. S. CUSHING, W. H. CROCKER, J. COSTA.	
<i>Library Committee</i> —D. S. RICHARDSON, F. V. CORNISH, BERNARD BENFIELD.	
<i>Comet-Medal Committee</i> —W. W. CAMPBELL, STURLA EINARSSON, H. M. JEFFERS.	

BRUCE MEDALISTS

SIMON NEWCOMB†.....	
ARTHUR AUWERS†.....	
DAVID GILL†.....	
GIOVANNI V. SCHIAPARELLI†.....	
WILLIAM HUGGINS†.....	
HERMANN CARL VOEGEL†.....	
EDWARD C. PICKERING†.....	
GEORGE W. HILL†.....	
JULES-HENRI POINCARÉ†.....	
PROF. J. C. KAPTEYN.....	Astronomical Laboratory, Gröningen, Holland.
OSKAR BACKLUND†.....	
Dr. W. W. CAMPBELL.....	Lick Observatory, Mount Hamilton, Cal.
PROF. GEORGE E. HALE.....	Solar Observatory, Pasadena, Cal.
Dr. E. E. BARNARD.....	Yerkes Observatory, Williams Bay, Wis.
PROF. E. W. BROWN.....	Yale University, New Haven, Conn.

PATRONS OF THE SOCIETY

EDWARD SINGLETON HOLDEN,† FOUNDER.

JOSEPH A. DONOHUE,†

ALEXANDER MONTGOMERY,†

CATHERINE WOLFE BRUCE,†

JOHN DOLBEER,†

WILLIAM ALVORD,†

WILLIAM MONTGOMERY PIERSON,†

ADOLFO STAHL.

†Deceased.

## PUBLICATIONS OF THE

- ABETTI, Prof. ANTONIO..... Ossevatorio Arcetri, Firenze, Italy.
- ABBT, Dr. EVELYN ..... Marciana Marina, Prov. Livorno, Italy.
- ADAMS, Mr. C. H..... 129 24th Ave., San Francisco, Cal.
- ADAMS, Dr. WALTER S..... Solar Observatory, Pasadena, Cal.  
Foreign Assoc. R.A.S.
- ADDISON, Dr. THOMAS..... 2425 Channing Way, Berkeley, Cal.
- AITKEN, Prof. R. G..... Lick Observatory, Mount Hamilton, Cal.  
Foreign Assoc. R.A.S.
- ALDIS, Prof. W. STEDMAN, F.R.A.S.\* .. 5 Beacon Oak Road, Tenterden, Kent, England.
- ALEXANDER, Miss ANNIE M.\*..... Innisfail Farm, Suisun, Cal.
- ALLARD, Mr. S. I..... First National Bank, Eureka, Cal.
- ALLYNE, Miss EDITH W..... 2609 Gough St., San Francisco, Cal.
- ALTSCHUL, Mr. CHARLES..... 32 W. 86th St., New York, N. Y.
- ANDERSON, Mr. F. B..... Bank of California, San Francisco, Cal.
- ARNOLD, Mr. RALPH..... 825 Union Oil Building, Los Angeles, Cal.
- ASH, Mr. DORSEY..... 2555 Buena Vista Way, Berkeley, Cal.
- AUBERTIN, Mr. J. J., F.R.A.S.\*..... 33 Duke St., St. James, S. W., London, England.
- BABCOCK, Mr. ALLEN H..... 2227 Piedmont Ave., Berkeley, Cal.
- BACHMAN, Mr. E. H..... Globe, Arizona.
- BAIRD, Mr. B. A..... 135 14th Ave., San Francisco, Cal.
- BARNARD, Dr. E. E.\*..... Yerkes Observatory, Williams Bay, Wis.  
Foreign Assoc. R.A.S.
- BATEMAN, Prof. H..... Throop College, Pasadena, Cal.
- BAUER, Mr. HANS B..... Manitowoc, Wis.
- BAUMGARDT, Dr. MARS F..... Office of Clark Observatory, 1105 Hollingsworth Building, Los Angeles, Cal.
- BECKHARD, Mr. MARTIN..... 52 William St., New York, N. Y.
- BENDER, Mr. ALBERT M..... 311 California St., San Francisco, Cal.
- BENEDICT, Mr. PAUL M..... 205 St. Ronan St., New Haven, Conn.
- BENFIELD, Mr. BERNARD..... 719 Rialto Building, San Francisco, Cal.
- BIEFELD, Mr. P., PH.D..... Granville, Ohio.
- BISSELL, D. P..... Guymon, Okla.
- BLACK, Mr. A. L..... C/o Bank of California, San Francisco, Cal.
- BLANDING, Mr. GORDON\*..... Belvedere, Marin Co., Cal.
- BLANEY, Mr. CHARLES D..... Saratoga, Cal.
- BLENCOE, Mr. DAVID A..... Alma Center, Wis.
- BLOCHMAN, Mr. L. E..... 2434 Bowditch St., Berkeley, Cal.
- BOLFING, Mr. A. T..... 3710 Leighton St., Oakland, Cal.
- BOSTWICK, Dr. A. E..... 14 N. Kingshighway, St. Louis, Mo.
- BOOTHROYD, Prof. S. L.\*..... Department of Astronomy, University of Washington, Seattle, Wash.
- BOULTON, JR., Mr. HENRY LORD, F.R.A.S.\*..... Caracas, Venezuela, or Box 2015, New York, N. Y.
- BOURNE, Mr. WILLIAM B.\*..... "Filoli," San Mateo, Cal.

---

\*Life Member.

ASTRONOMICAL SOCIETY OF THE PACIFIC      5

- BRACKETT, Prof. F. P. .... Pomona College, Claremont, Cal.  
 BRASCH, Mr. F. E. .... C/o John Crerar Library, Chicago, Ill.  
 BRASHEAR, Mr. J. A., F.R.A.S. .... Allegheny City, Pa.  
 BRENNAN, Rev. M. S. .... 6304 Minnesota Ave., St. Louis, Mo.  
 BREWER, Mr. EDWARD M. .... 27 Kilby St., Boston, Mass.  
 BRITTON, Mr. JOHN A.\* .... 445 Sutter, St., San Francisco, Cal.  
 BROCK, Rev. HENRY M., S.J. .... Woodstock College, Woodstock, Maryland.  
 BROWN, Mr. ARTHUR M. .... 202 Sansome St., San Francisco, Cal.  
 BROWN, Miss FLORENCE. .... 1217 12th St., Modesto, Cal.  
 BROWNE, Mr. ALEXIS L. .... 365 Market St., San Francisco, Cal.  
 BUNYAN, F. W. .... 2223 Union St., Berkeley, Cal.  
 BURCKHALTER, Mr. CHARLES, F.R.A.S. .... Chabot Observatory, Oakland, Cal.  
 "Butsuri". .... C/o Mazuren Co., Sanjodori, Kyoto, Japan.  
 CALLANDREAU, Dr. J.\* .... Oradour sur Vayres, Haute Vienne, France.  
 CAMPBELL, Prof. W. W.\* .... Director of Lick Observatory, Mount Hamilton, Cal.  
 CANNEY, Rev. ALBERT J. .... 4136 Woodland Park Ave., Seattle, Wash.  
 CASEY, Col. THOMAS L., U. S. A.\* .... Stoneleigh Court, Washington, D. C.  
 CEBRIAN, Mr. J. C.\* .... 1801 Octavia St., San Francisco, Cal.  
 CHRETIEN, Dr. HENRI. .... L'Observatoire Astronomique, Nice, France.  
 CLARK, Mr. EDWARD H. .... 15 Broad St., New York, N. Y.  
 CLARK, Mr. MATEO\*. .... 1 Victoria St., Westminster, S. W., London, England.  
 CLARK, Mr. W. A. JR.\* .... 2205 N. Adams St., Los Angeles, Cal.  
 CLEMENT, Miss ADA. .... 3435 Sacramento St., San Francisco, Cal.  
 COIT, Mr. JUDSON B. .... 688 Boylston St., Boston, Mass.  
 COLE, Mr. EDWIN L. .... Apartado No. 1122, City of Mexico, Mexico.  
 COLEMAN, Miss PERSIS H. .... 1834 California St., San Francisco, Cal.  
 COLES, BLAINE B. .... 503 E. 52nd St., Portland, Oregon.  
 COLLINS, Dr. Wm. M. .... 2701 Larkin St., San Francisco, Cal.  
 COLTON, Mr. A. L.\* .... P. O. Box 137, Washington, D. C.  
 COMFORT, Major S. .... C/o Guaranty Trust Co., 140 Broadway, New York, N. Y.  
 CONLISK, Mr. C. W. .... 2398 Vallejo St., San Francisco, Cal.  
 CONROY, Mr. CHARLES C., F.R.A.S. .... P. O. Box 826, Los Angeles, Cal.  
 CORNISH, Mr. FRANK V. .... Underwood Bldg., San Francisco, Cal.  
 CORWIN, Dr. CECIL. .... Hayward, Cal.  
 COSTA, Mr. J. .... 246 Montgomery St., San Francisco, Cal.  
 COUINIAN, Mr. EDWARD. .... Knight Printing Co., 311 Battery St., San Francisco, Cal.  
 CRANE, Miss ALICE F. .... Chapman, Corte Madera, Cal.  
 CRANE, Mr. JOHN J.\* .... Sandwich, Mass.  
 CRAWFORD, Prof. RUSSELL TRACY. .... Students' Observatory, Berkeley, Cal.

---

\*Life Member.

## PUBLICATIONS OF THE

CRAWFORD, Mr. J. W.	Royal Bank Chambers, Calgary, Alberta.
CROCKER, Mr. WILLIAM H.*	Crocker National Bank, San Francisco, Cal.
CUMMINGS, Miss EDITH E.	Lick Observatory, Mt. Hamilton, Cal.
CURTIS, Prof. HEBER D.	Lick Observatory, Mount Hamilton, Cal.
CUSHING, Mr. CHAS. S.*	821 First National Bank Building, San Francisco, Cal.
DAVIDSON, Mr. J. EWEN*	98 Banbury Road, Oxford, England.
DE LANDERO, Mr. C. F.*	1st Alamo 4, City of Mexico, Mexico.
DE SABLA, JR., Mr. E. J.*	San Mateo, Cal.
DE YOUNG, Mr. M. H.	S. F. Chronicle, San Francisco, Cal.
DEVLIN, Mr. FRANK J.	100 Sansome St., San Francisco, Cal.
DONOHOE, Mr. J. A.	V. P. Donohoe-Kelly Banking Co., San Francisco, Cal.
DOUGLASS, Prof. A. E.	University of Arizona, Tucson, Arizona.
DREW, Mr. F. C.	523 Balboa Building, San Francisco, Cal.
DRUM, Mr. JOHN	1 Grant Ave., San Francisco, Cal.
DRYDEN, Lieut. JOHN F.	C/o Prudential Insurance Co., Newark, N. J.
DYER, Mr. ERNEST I.	936 Union Oil Building, Los Angeles, Cal.
EASTON, Mr. KIMBALL G.	702 Balboa Building, San Francisco, Cal.
EDWARDS, Prof. GEORGE C.	2546 Dana St., Berkeley, Cal.
EINARSSON, Dr. STURLA	Students' Observatory, Berkeley, Cal.
ELLERMAN, Mr. FERDINAND	Solar Observatory, Mount Wilson, Cal.
ELLIOTT, Capt. JOHN M., U. S. N.	Mare Island, Cal.
EVERSHED, Mrs. JOHN	The Observatory, Kodaikanal, South India.
FANCHER, Mr. F. R.	Redondo Beach, Cal.
FONTANA, Mr. M. J.	825 Francisco St., San Francisco, Cal.
FORBES, Mr. ANDREW B.*	Formerly 401 California St., San Francisco, Cal.
FORTMANN, Mr. HENRY F.*	85 Second St., San Francisco, Cal.
FOSTER, Mr. ARTHUR W.*	Flood Bldg., San Francisco, Cal.
FRY, Mr. ROBERT D.*	San Francisco, Cal.
FYFE, Mr. J. M.	7111 Kelly St., E. E., Pittsburg, Pa.
GATRELL, Mr. HARRY P.	1218 Seaton St., Vancouver, B. C.
GALLOWAY, Mr. J. D.	1500 Euclid Ave., Berkeley, Cal.
GOMPERTS, Mr. N. J.	Göteborg, Sweden.
GRANT, Mr. JOSEPH D.*	Burlingame, Cal.
GRAY, Mr. E. C.	North Jay, Maine.
GREEN, Mr. R. B.	C/o American Smelting & Refining Co., Hayden, Arizona.
GREIG, Mr. ANDREW*	10 Cluny Gardens, Edinburgh, Scotland.
HAGAR, Mr. STANSBURY	48 Wall St., New York, N. Y.
HALE, Prof. GEORGE E.*	Director of Solar Observatory, Solar Observatory Office, Pasadena, Cal. Foreign Assoc. R.A.S.
HALE, Mr. REUBEN B.	901 Market St., San Francisco, Cal.
HANSEN, Mr. POLYCARP	Collegeville, Minn.

---

\*Life Member.

ASTRONOMICAL SOCIETY OF THE PACIFIC      7

HARTNESS, Mr. JAMES.....	30 Orchard St., Springfield, Vt.
HEUTER, Mr. E. L.....	805 Flatiron Building, San Francisco, Cal.
HILL, Mr. HORACE L.*.....	C/o Laidlaw & Co., New York City.
HINCHMAN, LYDIA S.....	3635 Chestnut St., Philadelphia, Pa.
HODGHEAD, Mr. BEVERLY L.....	Holbrook Bldg., San Francisco, Cal.
HOFFMAN, Mr. SAMUEL V., F.R.A.S.*.....	91 Madison Ave., Morristown, N. J.
HOOD, Mr. WILLIAM*.....	Room 1057, 65 Market St., San Francisco, Cal.
HOOKER, Mrs. KATHERINE.....	Cloyne Court, Berkeley, Cal.
HOWAT, Mr. Wm.*.....	458 William St., Melbourne, Victoria.
HOWE, Pres. CHAS. S., F.R.A.S.....	Case Observatory, Cleveland, Ohio.
HOYT, Mrs. RUTH C.....	Vacaville, Cal.
HUNTER, Mr. S. C.....	New Rochelle, N. Y.
HUSSEY, Prof. W. J.*.....	Director Detroit Observatory, Ann Arbor, Mich.
HUTCHINSON, Mr. JAMES S.....	First National Bank Building, San Francisco, Cal.
HYDE, Mr. HENRY K.....	Ware, Mass.
ISHINOHE, Mr. NAOZO.....	875 Hatagaya-Machi, Yokohatu near Tokyo, Japan.
JEFFERS, Mr. HAMILTON M.....	Lick Observatory, Mount Hamilton, Cal.
JENKINS, Mr. OLIVER P.....	Stanford University, Cal.
JESURUN, Mr. EDWARD.....	P. O. Box 248, Palo Alto, Cal.
JOY, Dr. ALFRED H.....	Solar Observatory, Pasadena, Cal.
KAPTEYN, Prof. J. C.....	Astronomical Laboratory, Gröningen, Holland.
KELLEY, Mr. KENNETH.....	Ar-Kel Villa, San Jose, Cal.
KEENEY, Mr. CHARLES C.*.....	2220 Clay St., San Francisco, Cal.
KEMLING, Mr. FRED C.....	237 E. San Fernando St., San Jose, Cal.
KENNELLY, Prof. A. E., F.R.A.S.*.....	Division of Engineering, Harvard University, Cambridge, Mass.
KINNEY, Mr. CABELL C.....	201 Sansome St., San Francisco, Cal.
KNIGHT, Mr. WILLIAM H.....	621 Witmer St., Los Angeles, Cal.
KNOLLIN, Mr. E. M.....	Hayward Heath, Cal.
KNOWLES, Mr. L. E.....	Kimberly, Idaho.
KÖHL, Mr. TORVALD*.....	Odder, Denmark.
KOSTER, Mr. FREDERICK J.....	54 Commonwealth Ave., San Francisco, Cal.
KOSTER, Mr. JOHN L.....	433 California St., San Francisco, Cal.
LANNEAU, Mr. JOHN F.....	Wake Forest, N. C.
LAMPLAND, Mr. CARL O.....	Lowell Observatory, Flagstaff, Arizona.
LARKIN, Prof. EDGAR L.....	Director Mount Lowe Observatory, Echo Mountain, Cal.
LEE, Mr. FREDERICK M.....	485 California St., San Francisco, Cal.
LEONARD, Mr. FREDERICK C., F.R.A.S.	C/o Students' Observatory, Berkeley, Cal.
LEUSCHNER, Prof. A. O., F.R.A.S.....	Director Students' Observatory, Berkeley, Cal.

---

\*Life Member.

## PUBLICATIONS OF THE

- LEWIS, Mr. CLARENCE MACKENZIE\*. C/o Wm. Salomon & Co., 25 Broad St., New York, N. Y.
- LEWIS, Prof. E. P. .... Department of Physics, University of California, Berkeley, Cal.
- LEWIS, Mr. W. SCOTT ..... Krotona Institute, Hollywood, Los Angeles, Cal.
- LIETZ, Mr. ADOLPH ..... 61 Post St., San Francisco, Cal.
- LINSLEY, Prof. EARLE G. .... 2050 10th Ave., Oakland, Cal.
- LOOMIS, Mr. HENRY B.\* ..... Seattle, Wash.
- LUDEWIG, Mr. W. R. .... C/o J. A. Brashear, 1954 Perryville Ave., Pittsburg, Pa.
- MACK, Mr. A. .... 350 Mills Building, San Francisco, Cal.
- MADDRILL, Dr. JAS. D.\* ..... 997 Monadnock Bldg., San Francisco, Cal.
- MANSON, Mr. MARSDEN, C.E., PH.D. .... 812 Hobart Bldg., San Francisco, Cal.
- MARKWART, Mr. A. H. .... 377 Palm Ave., Oakland, Cal.
- MARTENS, Mr. FERDINAND ..... 1809 Euclid Ave., Berkeley, Cal.
- MAW, Mr. W. H., F.R.A.S.\* ..... 18 Addison Road, Kensington, London, England.
- MCADIE, Prof. A. G. .... Blue Hill Observatory, Readville, Mass.
- MCDONALD, Mr. R. S. .... 1402 Broadway St., San Francisco, Cal.
- MCENERNEY, Mr. GARRET W. .... 2002 Hobart Bldg., San Francisco, Cal.
- McGREGOR, Mr. JOHN A.\* ..... 2800 Pacific Ave., San Francisco, Cal.
- MCNEILL, Prof. MALCOLM ..... Lake Forest, Ill.
- MEYER, J. HENRY\* ..... 440 Montgomery St., San Francisco, Cal.
- MEYER, Dr. W. F. .... Students' Observatory, Berkeley, Cal.
- MICHAELS, Mr. HENRY ..... C/o Langley Michaels Co., San Francisco, Cal.
- MOFFITT, Mr. JAMES K. .... First National Bank, San Francisco, Cal.
- MOLERA, Mr. E. J., C.E.\* ..... 2025 Sacramento St., San Francisco, Cal.
- MOORE, Dr. J. H. .... Lick Observatory, Mt. Hamilton, Cal.
- MORRISON, Mr. A. F.\* ..... Crocker Bldg., San Francisco, Cal.
- MORLEY, Mr. EDWARD G. L. .... Niger House, Waimea St., Nelson, N. Z.
- MORSE, Mr. FREMONT, U.S.C. & G. SUR. .... Box 2512, San Francisco, Cal.
- MURPHY, Hon. B. D.\* ..... San Francisco, Cal.
- NEWELL, Mr. H. F., F.R.S.\* ..... Director Astrophysical Observatory, Cambridge, England.
- NEWBEGIN, Mr. A. M. .... Lyndale, Langley Park Road, Sutton, Surrey, England.
- NOORDHOFF, Mr. P. .... Gröningen, Holland.
- NUTTING, Mr. FRANKLIN P.\* ..... 339 Holbrook Bldg., San Francisco, Cal.
- O'HALLORAN, Miss ROSE ..... 237 Broderick St., San Francisco, Cal.
- OLNEY, Hon. WARREN, SR. .... 427 29th St., Oakland, Cal.
- OLNEY, Mr. WARREN, JR.\* ..... 1107 Merchants Exchange Building, San Francisco, Cal.
- PADDOCK, Dr. GEORGE FREDERICK\*. 63 Governor St., Providence, R. I.
- PALMER, Mr. WILLIAM J. .... 15 Broad St., New York, N. Y.
- PARDEE, Hon. GEORGE C. .... 672 11th St., Oakland, Cal.

---

\*Life Member.

## ASTRONOMICAL SOCIETY OF THE PACIFIC      9

PARTELLO, Col. J. M. T., U. S. A....	Pacific Beach, Cal.
PATTEN, Mr. JOHN*.....	C/o Maryland Academy of Sciences, 105 W. Franklin St., Baltimore, Md.
PATTISON, Mr. WALTER.....	823 Ashland Ave., Wilmette, Ill.
PEASE, Mr. FRANCIS G.....	Solar Observatory, Pasadena, Cal.
PERKINS, Hon. GEO. C.*.....	Oakland, Cal.
PERRINE, Prof. C. D.*.....	Director Cordoba Observatory, Cordoba, Foreign Assoc. R.A.S. Argentine Republic.
PERRY, Mr. ARTHUR C.....	226 Halsey St., Brooklyn, N. Y.
PETTIT, Mr. EDISON .....	Yerkes Observatory, Williams Bay, Wis.
PHELAN, Hon. JAMES D.....	606 Phelan Bldg., San Francisco, Cal.
PHIPPS, Mr. HENRY, JR.*.....	Carnegie, Phipps & Co., Pittsburg, Pa.
PICKERING, Prof. WM. H.....	Harvard College Observatory, Mandeville, Jamaica, Br. W. I. Foreign Assoc. R.A.S.
PIKE, Mr. CHARLES W.*.....	22 Battery St., San Francisco, Cal.
PLUVINAL, COMTE A. DE LA BAUME.	13 Rue Langier, Paris, France.
POPE, Mr. GEORGE A.*.....	1018 Kohl Bldg., San Francisco, Cal.
PORTER, Miss JULIET*.....	37 Deane St., Worcester, Mass.
POST, Mr. CHARLES A., F.R.A.S.....	Post Bldg., 16 and 18 Exchange Place, New York, N. Y.
POTTER, Mr. ROBERT BURNSIDE*....	Anteitam Farm, Smithtown, L. I., N. Y.
PUTNAM, Mr. EDWARD W.....	519 California St., San Francisco, Cal.
RAMANAN, Dr., v.v. M.A., PH.D., etc.	1 Sami Pillai St., Chulai, Madras N. C., South India.
RAHR, Mr. REINHARDT.....	Manitowoc, Wisconsin.
REDMAN, Mr. A. W.....	914 Security Building, Los Angeles, Cal.
REED, Mr. WILLIAM G.....	Office of Farm Management, Washington, D. C.
RETTEMAYER, Mr. J. P.....	762 Fulton St., San Francisco, Cal.
RHEA, A. O.....	Thorp, Wis.
RHOADES, Mr. NELSON.....	224-5 H. W. Hellman Bldg., Los Angeles, Cal.
RICARD, Rev. J. S., s.J.....	Santa Clara, Cal.
RICHARDSON, Mr. DANIEL S.....	2541 Hilgard Ave., Berkeley, Cal.
RICHARDSON, Mrs. EVA F.....	2541 Hilgard Ave., Berkeley, Cal.
ROBERTS, Mrs. ISAAC*.....	Chateau Rosa Bonheur. By Thomery, Seine et Marne, France.
RODGERS, Mrs. ARTHUR*.....	Formerly Leavenworth and Vallejo Sts., San Francisco, Cal.
RORDAME, Mr. ALFRED.....	1031 E. Broadway, Salt Lake, Utah.
ROSENSTIRN, Dr. JULIUS.....	873 Sutter St., San Francisco, Cal.
ROSENBERG, Mr. ABRAHAM.....	334 California St., San Francisco, Cal.
ROSENBERG, Mr. MAX.....	334 California St., San Francisco, Cal.
ROSENTHAL, Mr. LOUIS.....	302 California St., San Francisco, Cal.
ROTHSCHILD, Mr. JOHN.....	Market and Spear Sts., San Francisco, Cal.
SANFORD, Dr. Roscoe F.....	Solar Observatory, Pasadena, Cal.
SARGENT, Mr. GEO. C.....	Hobart Bldg., San Francisco, Cal.

\*Life Member.

## PUBLICATIONS OF THE

- SCHAEBERLE, Prof. J. M.\* ..... 502 Second St., Ann Arbor, Mich.  
 SCHIFF, Mr. JACOB H.\* ..... 932 Fifth Ave., New York, N. Y.  
 SCHMIDT, Mr. RICHARD E. .... 113 Bellevue Place, Chicago, Ill.  
 SCHWIERS, Mr. LUDWIG ..... Lower Lake, Cal.  
 SEAGRAVE, Prof. FRANK E. .... Adams House, Boston, Mass.  
 SEARES, Prof. FREDERICK H. .... Solar Observatory, Pasadena, Cal.  
     Foreign Asso. R.A.S.  
 SEE, Dr. T. J. J., F.R.A.S.\* ..... Naval Observatory, Mare Island, Cal.  
 SELGA, Prof. M., S.J. .... Observatory of Manila, Manila, P. I.  
 SHAPLEY, Dr. HARLOW ..... Mt. Wilson Solar Observatory, Pasadena, Cal.  
     Foreign Assoc. R.A.S.  
 SHERWOOD, Mr. HENRY H. .... 47 Beale St., San Francisco, Cal.  
 SLIPHER, Mr. V. M. .... Lowell Observatory, Flagstaff, Arizona.  
     Foreign Assoc. R.A.S.  
 SMITH, Mr. E. C.\* ..... Saint Albans, Vermont.  
 SMYTHE, Mr. GEORGE A. .... Benchland, Montana.  
 SNOW, Lt. LORENZO L. .... Sig. R. C. A. S., Ellington Field, Houston,  
     Texas.  
 SNYDER, Prof. M. B., F.R.A.S. .... Director of Philadelphia Observatory,  
     Philadelphia, Pa.  
 SPENCER, Mr. GEORGE OTIS ..... 209 South La Salle St., Chicago, Ill.  
 SPRECKELS, Mr. A. B.\* ..... 58 Clay St., San Francisco, Cal.  
 SPRECKELS, Mr. C. A.\* ..... 138 Front St., New York, N. Y.  
 SPRECKELS, Mrs. C. A.\* ..... 91 Wall St., N. Y.  
 SPRECKELS, Mr. RUDOLPH ..... 1900 Pacific Ave., San Francisco, Cal.  
 SPROULE, Mr. WILLIAM\* ..... S. P. Bldg., San Francisco, Cal.  
 STAHL, ADOLFO\* ..... Alaska Com'l Bldg., 310 Sansome St.,  
     San Francisco, Cal.  
 STANFORD, Miss GERTRUDE ..... Warm Springs, Alameda County, Cal.  
 STILLMAN, Dr. STANLEY ..... 2336 Broadway St., San Francisco, Cal.  
 ST. JOHN, Dr. CHARLES E. .... Solar Observatory, Pasadena, Cal.  
     Foreign Assoc. R.A.S.  
 STONE, Mr. JULIUS\* ..... C/o Seagrave Co., Columbus, Ohio.  
 STOV, Mr. SAM B. .... 332 Pine St., San Francisco, Cal.  
 STROYBERG, Mr. V.\* ..... Stationsvej 4 Gentofte, Copenhagen,  
     Denmark.  
 SWAN, Prof. D. S. .... 1219 Harper Ave., Los Angeles, Cal.  
 TALBOT, Mr. C. F. A. .... Redwood City, Cal.  
 TAUSSIG, Mr. RUDOLPH J. .... 1521 Van Ness Ave., San Francisco, Cal.  
 THORHAMNER, Mr. THEODORE ..... 204½ Washington St., Portland, Oregon.  
 TOWNE, Mr. A. G. .... 2524 Pierce St., San Francisco, Cal.  
 TOWNLEY, Prof. S. D. .... P. O. Box 815, Stanford University, Cal.  
 TRABERT, Mr. CHARLES L. .... 2736 Elmwood Ave., Berkeley, Cal.  
 TROTT, Mr. T. ELMER. .... 50 E. College St., Alliance, Ohio.  
 TRUMAN, Mr. A. H. .... Lowell Observatory, Flagstaff, Arizona.  
 TUCKER, Prof. R. H. .... Lick Observatory, Mount Hamilton, Cal.  
 TURNER, Dr. ARTHUR B. .... Montclair, N. J.  
 TURNER, Mr. HENRY J.\* ..... Woodville, Rappahannock Co., Virginia.

---

\*Life Member

## ASTRONOMICAL SOCIETY OF THE PACIFIC 11

TYSON, Mr. R. J.*.....	Seaboard Bank, 24 Market St., San Francisco, Cal.
VANCE, Mr. J. R.....	P. O. Box 282, Oilfields, Fresno Co., Cal.
VANDRUFF, R. E.....	Box 176, Lordsburg, N. M.
VAN MAANEN, Dr. A.....	Solar Observatory, Pasadena, Cal.
VILLIGER, Dr. W.....	C/o Carl Zeiss; z. Hd. Dr. M. von Rohr, Jena, Germany.
VOLKMANN, Mr. GEORGE F.*.....	301 Second St., San Francisco, Cal.
VON GELDERN, Mr. OTTO.....	865 Pacific Building, San Francisco, Cal.
VOÛTE, M. J.....	Koninklijk Magnetisch en Meteorologisch Observatorium te Weltevreden, (Batavia) Dutch East Indies.
WARNER & SWASEY CO., THE.....	2701 Carnegie Ave., Cleveland, Ohio.
WELLS, Mr. ARTHUR B.....	19 S. La Salle St., Room 914, Chicago, Ill.
WESTFALL, S. H.....	504 Bank of Italy Bldg., San Francisco, Cal.
WILLMARTH, Mrs. MARY H.*.....	222 Michigan Ave., Chicago, Ill.
WILSON, Mr. FREDERICK A.....	328 Mason St., San Francisco, Cal.
WITKOVSKY, Gen. B.*.....	Lesnoi, Gr. Obiesdnaja 16, St. Petersburg, Russia.
WOODMAN, Rev. CLARENCE E.....	Newman Hall, 2630 Ridge Road, Berkeley, Cal.
SC.D., PH.D., LITT.D., LL.D.....	
WRIGHT, Mr. HENRY N.....	Whittier College, Whittier, Cal.
YAMASAKI, Mr. M.....	1739 Euclid Ave., Berkeley, Cal.
ZEISS, Mr. CARL.....	Jena, Germany.
ZIEL, Mr. F. R.....	607 Merchants Exchange Bldg., San Francisco, Cal.

### INSTITUTIONAL MEMBERS

CALIFORNIA STATE LIBRARY.....	Sacramento, Cal.
DANIEL SCHOLL OBSERVATORY.....	Franklin and Marshall College, Lancaster, Pa.
CHIEF ASTRONOMER.....	Department of the Interior, Ottawa, Can.
PERKINS OBSERVATORY.....	Ohio Wesleyan University, Delaware, Ohio.
PHOENIX PUBLIC LIBRARY.....	Phoenix, Arizona.
DIRECTOR DOMINION ASTROPHYSICAL OBSERVATORY.....	Victoria, B. C.
DIRECTOR DOMINION ASTRONOMICAL OBSERVATORY.....	Ottawa, Canada.
ASTRONOMICAL SECTION.....	Wellington, Philosophical Society, Wellington, N. Z.
LIBRARY OF THE CHABOT OBSERVATORY.....	Oakland, Cal.
LIBRARY OF THE UNIVERSITY OF MINNESOTA.....	Minneapolis, Minn.
LIBRARY OF THE UNIVERSITY OF CALIFORNIA.....	Berkeley, Cal.

— \*Life Member.

## PUBLICATIONS OF THE

- LIBRARY OF THE UNIVERSITY OF  
ILLINOIS..... University Station, Urbana, Ill.
- LIBRARY OF THE UNIVERSITY OF  
INDIANA..... Bloomington, Indiana.
- LIBRARY OF THE UNIVERSITY OF  
MICHIGAN..... Ann Arbor, Mich.
- LIBRARY OF THE UNIVERSITY OF  
NEBRASKA..... Lincoln, Neb.
- LIBRARY OF THE UNIVERSITY OF  
PENNSYLVANIA..... Philadelphia, Pa.
- LIBRARY OF THE UNIVERSITY OF  
WASHINGTON..... Seattle, Wash.
- LIBRARY OF YALE UNIVERSITY.... New Haven, Conn.
- LIBRARY OF THE UNIVERSITY OF  
KANSAS..... Lawrence, Kas.
- LOWELL OBSERVATORY..... Flagstaff, Ariz.
- NEW YORK PUBLIC LIBRARY..... 476 5th Ave., New York, N. Y.
- OAKLAND FREE PUBLIC LIBRARY... Oakland, Cal.
- SPROUL OBSERVATORY..... Swarthmore College, Swarthmore, Pa.
- SEATTLE PUBLIC LIBRARY..... Seattle, Wash.
- SHATTUCK OBSERVATORY..... Dartmouth College, Hanover, N. H.
- SMITH COLLEGE LIBRARY..... Northampton, Mass.
- THE ASTRONOMER..... Union Observatory, Johannesburg,  
Transvaal.
- THE JOHN CRERAR LIBRARY..... Chicago, Ill.
- THE DIRECTOR OF THE OBSERVATORY  
OF STRASBOURG..... France.
- THE PUBLIC LIBRARY..... Boston, Mass.
- THE PUBLIC LIBRARY..... Los Angeles, Cal.
- WASHINGTON UNIVERSITY LIBRARY. St. Louis, Mo.
- LIBRARY OF WESLEYAN UNIVERSITY Middletown, Conn.
- LIBRARY OF WELLESLEY COLLEGE.. Wellesley, Mass.
- LIBRARY OF BROWN UNIVERSITY... East Side Station, Providence, R. I.
- LIBRARY U. S. MILITARY ACADEMY. West Point, N. Y.
- LIBRARY OF WILLIAMS COLLEGE.... Williamstown, Mass.
- CASE SCHOOL OF APPLIED SCIENCE. Room 503 Chamber of Commerce Bldg.  
Cleveland, Ohio.
- LIBRARY OF THE LELAND STANFORD  
JR. UNIVERSITY..... Stanford University, Cal.
- LIBRARY OF THE LICK OBSERVATORY Mount Hamilton, Cal.
- LIBRARY OF THE MECHANICS IN-  
STITUTE..... 57 Post St., San Francisco, Cal.
- LIBRARY OF PRINCETON UNIVERSITY Princeton, N. J.
- LIBRARY OF ST. IGNATIUS COLLEGE.. 2211 Hayes St., San Francisco, Cal.
- LIBRARY OF THE UNIVERSITY OF  
IOWA..... Iowa City, Iowa.
- THE LIBRARIAN OF THE UNIVERSITY Department of Astronomy, Sydney,  
LIBRARY..... New South Wales.
- BETHEL COLLEGE LIBRARY..... Newton, Kansas.
- SMITH OBSERVATORY LIBRARY..... Beloit, Wis.
- THE HECTOR OBSERVATORY..... Wellington, N. Z.
- SUPERINTENDENT..... Helwan Observatory, Helwan, Egypt.
- LIBRARY MOUNT HOLYOKE COLLEGE South Hadley, Mass.

## EXCHANGES

- Astronomische Nachrichten*, Kiel, Germany.  
 Prof. ELIS STRÖMGREN, Observatory of Copenhagen, Denmark.  
 Prof. A. A. NIJLAND, The Observatory, Utrecht, Holland.  
*Revista de la Sociedad Astronómica de España y América*, Barcelona, Spain.  
 Mr. C. A. CHANT, Royal Astronomical Society of Canada, Toronto, Can.  
 Observatorio Astronómico de Cartuja, Granada, Spain.  
*Gazette Astronomique*, Société d'Astronomie d'Auvers, 29 Stamford St., London, S. E., England.  
*Astrophysical Journal*, Yerkes Observatory, Williams Bay, Wisconsin.  
*Popular Astronomy*, Northfield, Minn.  
 The Editors of the Observatory, The Royal Observatory, Greenwich, England.  
 The Royal Observatory, Greenwich, England.  
 The Hon. Librarian, British Astronomical Association, Sion College, Victoria Embankment, London, E. C. 4, England.  
*Revista di Astronomia*, Società Astronomica Italiana, Turin, Italy.  
*Journal Astronomique*, Observatoire de Lille, Hem, France.  
*Astronomia Populare*, Palazzo Madama, Turin, Italy.  
 Società Astronomica Italiana, Rue Maria Vittoria 23, Turin, Italy.  
*Monthly Notices*, Royal Astronomical Society, London, England.  
 American Mathematical Society, 501 West 116th St., New York, N. Y.  
 Società degli Spettroscopisti Italiani, Catania, Italy.  
 Sociedad Científica "Antonio Alzate," City of Mexico, Mexico.  
 Solar Observatory, Mount Wilson, via Pasadena, Cal.  
 American Philosophical Society, 105 South Fifth St., Philadelphia, Pa.  
 Harvard College Observatory, Cambridge, Mass.  
*The Monthly Evening Star Map*, 150 Nassau St., New York, N. Y.  
*The Astronomical Herald*, Tokyo, Japan.  
 Publication of Pomona College, Claremont, Cal.  
*The Astronomical Journal*, Dudley Observatory, Albany, N. Y.  
*Journal of the Royal Astronomical Society of Canada*, 198 College St., Toronto, Canada.  
 Library Weather Bureau, Washington, D. C.  
 Mr EDWARD F. BIGELOW, President Agassiz Association, Sound Beach, Conn.  
 Department of Astronomy, Ryerson Laboratory, University of Chicago, Chicago, Ill.  
*Journal de Physique*, No. 1 Victor Cousin, Paris, France.  
 Sociedad Astronómica, via Diagonal 442-3 Ia, Barcelona, Spain.  
 Dirección de Estudios, Geográficos y Climatológicos, Tacubaya, City of Mexico, Mexico.  
 Hill Observatory, Sidmouth, Devon, England.

## PUBLICATIONS OF THE

## CORRESPONDING INSTITUTIONS

Albany, New York, Dudley Observatory.  
Arequipa, Peru, Southern Station, Harvard College Observatory.  
Allegheny, Pennsylvania, Allegheny Observatory.  
Armagh, Ireland, Armagh Observatory.  
Cambridge, England, University Observatory.  
Cape Town, Africa, Royal Observatory.  
Christiania, Norway, Universitaets-Sternwarte.  
Cincinnati, Ohio, Station O, Cincinnati Observatory.  
Columbia, Missouri, Laws Observatory, University of Missouri.  
Copenhagen, Denmark, Observatory.  
Cordoba, Argentine Republic, National Observatory.  
Dublin, Ireland, Dunsink Observatory.  
Dublin, Ireland, Royal Dublin Society.  
Edinburgh, Scotland, Royal Observatory.  
Geneva, Switzerland, Observatoire.  
Glasgow, Scotland, University Observatory.  
Leyden, Holland, Universitaets-Sternwarte.  
Lisbon (Tapada), Portugal, Real Observatorio.  
London, England, British Museum.  
London, England, 86 Lee Road, The Nautical Almanac.  
London, England, Royal Astronomical Society.  
Hiram, Ohio, Observatory of Hiram College.  
La Plata, Argentine Republic, Observatory.  
Kodaikanal, Palani Hills, South India, Observatory.  
Lund, Sweden, University Observatory.  
Madison, Wisconsin, Washburn Observatory.  
Madrid, Spain, Observatorio Astronómico.  
Marseilles, France, l'Observatoire, Astronomique.  
Melbourne, Victoria, Observatory.  
Milan, Italy, Osservatoria Astronomica di Brera.  
Mount Wilson, via Pasadena, Cal., Solar Observatory.  
Naples, Italy, Osservatorio Astronomico.  
New Haven, Connecticut, Yale Observatory.  
New York, New York, Columbia University Observatory.  
Nice, France, l'Observatoire Astronomique.  
Northfield, Minnesota, Goodsell Observatory.  
Oxford, England, Radcliffe Observatory.  
Oxford, England, University Observatory.  
Padua, Italy, Osservatorio Astronomico.  
Paris, France, Bureau des Longitudes.  
Paris, France, Observatoire National.  
Paris, France, Rue Cassini 16, Société Astronomique de France.  
Rio de Janeiro, Brazil, Observatory.  
Rome, Italy, Osservatorio Astronomico del Collegio Romano.  
Rome, Italy, Specula Vaticana.  
San Francisco, Cal., California Academy of Sciences.  
San Francisco, Cal., Technical Society of the Pacific.

ASTRONOMICAL SOCIETY OF THE PACIFIC 15

Sydney, New South Wales, Observatory.  
Tacubaya, Mexico, Observatorio Astronómico Nacional.  
Tokyo, Japan, University Observatory.  
Toulouse, France, Observatoire.  
University Park, Colorado, Chamberlin Observatory.  
University of Virginia, Virginia, McCormick Observatory.  
University of Pennsylvania, Upper Darby, Pennsylvania, Flower Observatory.  
Upsala, Sweden, University Observatory.  
Washington, D. C., Library of Congress, Periodical Division.  
Washington, D. C., National Academy of Sciences.  
Washington, D. C., Naval Observatory.  
Washington, D. C., Smithsonian Institution.  
Washington, D. C., Nautical Almanac, U. S. Naval Observatory.  
Washington, D. C., U. S. Coast and Geodetic Survey.  
Williams Bay, Wisconsin, Yerkes Observatory.  
Zurich, Switzerland, Observatory.